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ABSTRACT

A discussion of factors associated with evaluation of proposed alternative educational systems is presented in brief form. Emphasis is given to enumeration of critical characteristics serving as the basis of comparison, examination of alternative systems in terms of each characteristic, and determination based on the comparison as to whether the systems are meaningful alternatives. Six characteristics are presented as central to the comparison of proposed educational programs: (1) learning outcomes; (2) maximizing the number of available alternative options; (3) voluntary attendance; (4) management of motivation; (5) cost effectiveness; and (6) support of and identification with program by staff and community. A brief discussion of measurement considerations pertaining to each characteristic is also included. A selected bibliography is appended. (BL)

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Consideration of Alternative Educational Systems

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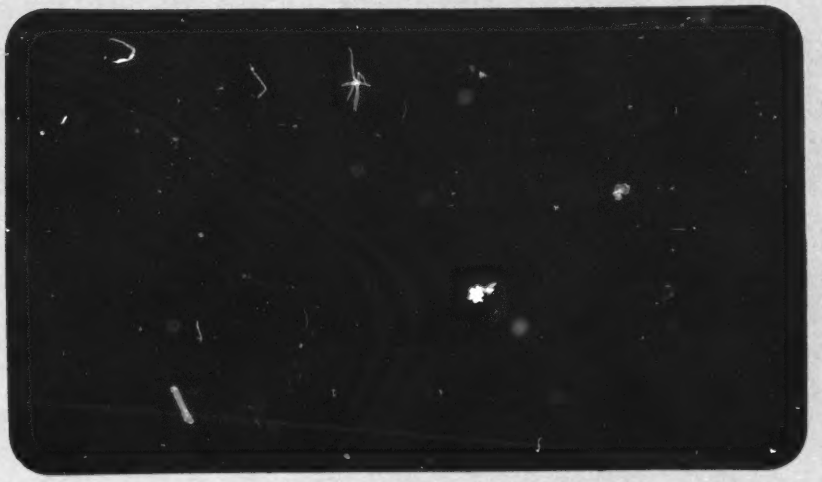

The Human Resources Research Organization (HumRRO) is a nonprofit corporation established in 1969 to conduct research in the field of training and education. It was established as a continuation of The George Washington University, Human Resources Research Office. HumRRO's general purpose is to improve human performance, particularly in organizational settings, through behavioral and social science research, development, and consultation.

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The Office of Education has expressed interest in the development of alternative educational programs of three types: school-based, employer-based, and home-based. All three will emphasize career development and promote closer integration between academic and vocational education. This paper, in response to a request from the Office of Education, will consider some of the factors related to the evaluation of alternative educational models with the goal of building toward a comprehensive overview of the complicated issues involved.

Educational systems may be compared in terms of objectives and the methods by which they seek to achieve their objectives. Two systems that share identical objectives and common methods can be considered "alternatives" in only a trivial sense. Systems with dissimilar objectives but common methods will necessarily produce different products and cannot be directly compared as to relative effectiveness. Systems which vary both as to objectives and methods are even further noncommensurable. Consistent with the OE's requirement of exploration of alternative systems, the following discussion assumes common objectives and seeks to specify critical methodological variables.

In our view the evaluation of alternative educational systems should follow this procedure: (1) enumeration of critical characteristics serving as the basis of comparison, (2) examination of "alternative" systems in terms of each characteristic, and (3) determination based on the comparison as to whether the systems are meaningful alternatives. Evaluation and modification can proceed as follows: (4) an empirical investigation of the impact of the critical characteristics on learning outcomes, (5) sub-studies to determine the differential effectiveness of alternatives with designated

sub-populations; and (6) continued monitoring and introduction of modifications designed to enhance effectiveness.

This paper deals only with the first three steps in the procedure outlined above and contains: (1) a statement of the characteristics which need to be considered in the comparison of alternative education programs; (2) a brief description of each of these characteristics; (3) suggestions of ways for measuring each of the characteristics; and (4) suggestions as to further information and studies that will be needed to permit satisfactory measurement of the characteristics. No attempt will be made at this time to weight the individual characteristics, although such judgments will eventually be required.

Two excellent references pertaining to the evaluation of educational approaches are the report of The Commission on Instructional Technology (1), and the American Council on Education's recently published 2nd Edition of Educational Measurement (2). These documents include descriptions of the issues, techniques, and states of the art from specific to general, which, coupled with extensive bibliographies, provide the manager, researcher, or practitioner with ample information, material, and cautions.

CHARACTERISTICS OF EFFECTIVE EDUCATIONAL SYSTEMS

In considering the six characteristics discussed below, it must be recognized that the list may not be exhaustive and that the characteristics are not necessarily mutually independent.

I Learning Outcomes: The effects of an educational program are not restricted to the learning of subject matter. In fact, a great deal more learning takes place in schools than is generally recognized. The full

range of learning outcomes may include profound alterations in a student's cognitive, attitudinal, and interpersonal dispositions. In addition, educators are more and more often asserting that what is probably most influential in learning situations is the medium or the context through which instruction occurs; students are shaped by the attitudes, the social structure and climate, and the unspoken assumptions found in any learning situation. In examination of educational alternatives, the extent to which the full range of learning outcomes and the "hidden agenda" of pre-instructional programs is made explicit must be given consideration.(3,4,5)

Among outcomes produced by instructional systems, the one that has been given by far the greatest attention is the acquisition of skill and knowledge.

The necessity for demonstrating rate and amount of skill and knowledge acquisition has been generally recognized as fundamental to any educational program. Underlying the measurement question is the technique for specifying of the objectives of the instructional program. As Morgan (8) states, "The cornerstone of instructional technology and training can be operationally defined in terms of learner performance." Although much needs to be done on developing classification schemes, or procedures for stating objectives, considerable gain has been made in the cognitive and skill areas (e.g., classification: Bloom (9), Gagne' (10), Krathwohl (11), Fine (12), Yagi (7), Haggard (13); procedures: Edling (14), Mager (15), Smith (16), Ammerman & Melching (17)).

Since one facet of the evaluation of instructional programs is the relationship between instructional objectives and ultimate goals, it is

critical to examine the procedures employed to determine (1) the domain of tasks representing the goal, and (2) the material employed to select test-tasks to represent terminal objectives (18). A parallel question is the manner in which enabling objectives (curriculum progression) articulate with terminal objectives (formal outcomes) (17). Goals refer to long-range concerns (e.g., work or job); enabling objectives refer to progress through the curriculum. Mediating between the two are the terminal objectives of the instructional system.

Discriminating among alternative systems requires a precise specification of the nature of program evaluation, as well as a determination of the manner of use of criterion or normative referenced testing in governing the procedures for selection, placement, management of progress through the curriculum, and definition of "successful" completion (18).

In addressing the question of measurement, often the test designer is faced with a plentitude of objectives from which to select, and it becomes painfully apparent that there are more skills and knowledges to be evaluated than time or the program structure allows for. This dilema can to some extent be resolved. Classification schemes such as Bloom's or Gagne's allow for ordering items hierarchically so that if a correct answer is made to a given item, assurance is provided that other skills and knowledges subsumed have also been mastered. Schemes such as the one developed by Fine (12) and Yagi, et al. (7), also provides a procedure for ordering activities into classes or categories; e.g., analyzing, synthesizing. Process categories such as problem solving and diagnosing can be utilized as well. The caution being that steps must be taken

to insure test-tasks developed from such categorization are representative of the domain.

With an emphasis on performance based evaluation, there follows naturally an emphasis on having the learner produce the actual performance in the test-task. Unfortunately, job performance evaluation is expensive, time consuming, as well as methodologically and managerially difficult. The use of performance tests in operational assessment programs is sometimes not practicable. In such cases, use is frequently made of secondary criteria such as job sample tests, knowledge paper and pencil tests, and ratings or rankings. Some information exists on the relationship of these assessment procedures and some suggestions as to their applicability. Vineberg and Taylor, for a variety of jobs, provide comparative data on job sample tests, job knowledge tests, and supervisor ratings (19). As one moves away from straight knowledge testing and skill testing is required, the fidelity of the test-task becomes critical. Careful attention has to be given to the fidelity of simulation (degrees of realism) required in a criterion referenced test, Fitzpatrick & Morrison (20), Crawford (21). These references provide excellent discussions of and factors to consider in simulation with examples and applications of performance and product type tests (e.g., situational test, work-sample test, and games).

The growing concern with the impact of the "hidden agenda" of educational programs on outcomes other than with respect to subject matter has not yet generated a systematic methodology for empirical measurement. The development of such a methodology is, however, a necessary condition

for meaningful comparison between educational alternatives. The emerging methodology must relate the two aspects of the problem: (1) the variety of cognitive, attitudinal, and interpersonal outcomes, and (2) facets of the social structure and process of education.

(1) Proposed alternatives can be compared as to the intended emphasis on developing self esteem among students as well as fostering better understanding and positive attitudes towards education, work, and other societal factors.

(2) Alternative educational systems can also be compared with regard to such factors as degree of regimentation, formality of structure, and role of students and staff in the various components of the educational process.

Each of these two aspects of the normally non-specified properties of educational systems involves special measurement considerations. With regard to the first, there exist fairly well validated instruments, as well as a methodology for the development of scales to measure such factors as self concept, self esteem, patterns of interpersonal relationship, and attitudes toward a variety of social issues. In contrast, techniques for measuring critical properties of the structure and process of education especially as pertains to comparison of alternative systems, is at a much more rudimentary stage of development.

Regardless of the difficulties of measurement in these areas, the potential impact on education of the issues involved necessitate that alternative educational programs be examined as to (1) their recognition and specification of these properties, and (2) the proposed procedures for assessment.

II Maximizing the Number of Available Alternative Options: One

characteristic of our educational program is the degree to which it provides students with options. This applies to options within the program (such as media, subject matter and career development), across programs (that is, the privilege of switching between programs without loss of credit), and at the program terminus (such as career choice). While students from affluent families in "good" schools are normally provided with ample options, very often the only real option available for many disadvantaged students is withdrawal (either physical or psychological).

Measurement of this characteristic would be concerned with two issues: one involves the objective mechanisms for providing options, gauged by curriculum offerings and institutional procedures vis-a-vis content, method, style, etc. The other, after program implementation, involves subjective awareness on the part of the students as to the availability of options.

Across-program options may create special difficulties in measurement relating to the lack of defined procedures governing transfer and accreditation. Nevertheless, programs should be examined as to their recognition of and procedures for accreditation across programs. One example of how such accreditation might be done is the translating of "off campus" activities into traditional educational units. A rough structure for such a translation already exists (6). Based on a combination of some popular taxonomies and the DOT classification system, it would appear feasible. An O/E funded HumRRO project (7) similarly provides a scheme for analyzing programs and activities which could

provide a translation. Another approach is to insist on criterion referenced performance standards for both "off-campus" and on-campus (traditional program) activities. In this way credit is gained for measured mastery of designated objectives rather than for placement on an arbitrary normative distribution.

III Voluntary Attendance: To the "romantic" critics of education, compulsory attendance is the epitome of all that is wrong with public schooling. Goodman (3), Holt (4), Illich (5), and many others maintain that effective learning cannot be mandated. While this view tends to treat volunteerism as dichotomous, it is reasonable to assume that the more willingly a student participates in educational activity, the greater his learning. A counter argument is that although students may want to be in the "learning situation" this does not insure that they are actually learning. It is likely however, that what they are learning is not what the system attends to. If a community provides students with a choice of schools and if appreciably more students voluntarily participate in one, then that school, other things being equal, would be expected to be more effective. Measurement of this characteristic is straightforward--an enumeration of the choices available.

IV Management of motivation: This characteristic, though related to those previously discussed, warrants special mention. The currently very active behavior modification movement has properly pointed out the necessity for analyzing and understanding the reinforcement contingencies found in all learning environments. Techniques for designing, measuring,

and analyzing reinforcement patterns takes up a very large share of the current research literature (e.g., (22), (23)), and need not be reviewed here. What should be stressed is the dynamic relationship between "extrinsic" and "intrinsic" reinforcement. Extrinsic reinforcers, though essential for the acquisition of behavior patterns, will, under certain circumstances, become unnecessary for the maintenance of that behavior. Comparison of alternative programs must correspondingly be addressed from two perspectives: first, the procedure to be employed for providing extrinsic reinforcement, and second, the process, if any, whereby intrinsic reinforcement will develop.

V Cost Effectiveness: This pertains to the obvious consideration that other things being equal, a more economical program is better than a less economical program. Cost effectiveness procedures have been applied to vocational and technical programs (Kaufman, J., et al. (24)). It is questionable, however, whether a technical application of cost-benefit analysis would be appropriate since so many of the objectives outside of the area of knowledge and skill acquisition do not lend themselves to the precise quantification required. It is necessary, however to obtain data on the cost of the alternative in absolute terms: number of instructors, capital equipment, materials, etc., to compare with the standard program. This is especially true if, by some design, esoteric procedures were tried which would require heavy local funding after the federal support was withdrawn. In this sense, costs can quite easily be determined and compared.

VI Support of and Identification with Program by Staff and Community: To the extent a staff and community supports and identifies with a program,

the more likely it is that the program will be effective. Such often comes about through early and continuous involvement of these groups in planning and major decision making activities.

There is a large body of literature dealing with the role of staff and community representatives in effecting institutional change, and there is virtually no disagreement on the vital role these groups must play, the unlikelihood of an imposed-from-above program being effective, and the necessity of developing staff and community identification with the program (1). The disagreements arise from the choice of strategies and tactics one uses to bring these conditions about.

Comparisons can be made on the extent to which and the manner whereby programs have made provision for community coordination and feedback. Support and identification by staff and community can be measured through turnover and attendance rates, degree of voluntary involvement, attitude scale administration, and interviews and elections for the purpose of funding. One would expect, of course, an initial enthusiasm for a new program, but it is especially important to acknowledge, again, that once outside funding for an "alternative" is terminated, continuation will be highly dependent upon the attitudes of the staff and the community.

Summary:

We have presented in brief form a discussion of factors associated with evaluation of proposed alternative educational systems. A general procedure for evaluation was suggested. Emphasis was given to the first three steps in the suggested procedure. Six characteristics were discussed

that are central to the comparison of proposed alternative educational programs, including a brief discussion of measurement considerations pertaining to each characteristic.

A selected bibliography relevant to the issues raised is appended.

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